



საქართველოს ტექნიკური უნივერსიტეტი  
GEORGIAN TECHNICAL UNIVERSITY

Approved by  
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## Bachelor's Educational Program

Title of the program

მექანიკის ინჟინერია

Mechanical Engineering

Faculty

სატრანსპორტო სისტემებისა და მექანიკის ინჟინერიის ფაკულტეტი

Faculty of Transport Systems and Mechanics Engineering

Program Supervisor/ Supervisors

Professor Vazha Qiria

Associate professor Givi Sanadze

Qualification to be Awarded, and the Number of Credits in the Program

**Bachelor in Mechanical Engineering**

It will be awarded through a combination of 210 credits of course content relevant to the major field of study and 30 credits of free components, completion of at least 240 credits.

Teaching Language

English

Admission Prerequisites to the Program

The holder of a state certificate confirming complete general education or a document equivalent to it, who is enrolled in accordance with the procedure established by the legislation of Georgia, has the right to study at the bachelor's level.

In addition, in order to obtain the right to study at the English-language bachelor educational program of "Mechanical Engineering", it is necessary to pass the English language as a compulsory subject in the unified national exams and overcome the 70% or more threshold. or at least a B1 level certificate proving knowledge of the English language. In the absence of a similar document, the applicant takes the exam in the exam center in a foreign (English) language.

An applicant with a general education in English is not required to take the exam.

### Program Description

The bachelor educational program "Mechanical Engineering" was created based on the experience of both local and foreign universities in the field and taking into account the requirements of the labor market. The educational program is compiled according to the European Credit Transfer System (ECTS), 1 credit is equal to 25 academic hours, which includes both contact and independent work hours. Duration of the program is 4 years (8 semesters).

For the award of the "Bachelor in mechanical engineering" degree, the student must accumulate at least 240 credits, which ensures the achievement of the program objectives and the results required for the main qualification at the level of the Bachelor's degree descriptor of the Higher Education Qualifications Framework.

The educational program is made up of learning courses corresponding to the main field of study and free components. Learning courses of the content corresponding to the main field of study are presented in the form of mandatory and optional learning courses: 186 credits of compulsory learning courses, 6 credits of practice, 8 credits of bachelor's work and 10 credits of specialty elective courses. The program includes free components with a volume of 30 credits.

For the Bachelor in Mechanical Engineering degree, a student must accumulate at least 240 credits, which ensures the achievement of the program objectives and the results required for the main qualification at the level of the bachelor's degree descriptor of the Higher Education Qualifications Framework.

The educational program is made up of training courses and free components corresponding to the main field of study. Learning courses of the content corresponding to the main field of study are presented in the form of mandatory and optional learning courses: mandatory learning courses 186 credits, practice 6 credits, bachelor's bachelor work in the amount of 8 credits, and specialty elective learning courses in the amount of 10 credits. The program includes free components with a volume of 30 credits.

The student chooses a free component from the existing learning courses within the educational program of the first level of higher education in order to expand his horizons in the fields (issues) of interest to him.

Practice is a necessary component of higher education, which helps the student to become a professional and allows him to develop the theoretical knowledge he has acquired in a practical environment.

The procedure for organizing the educational process, conducting and evaluating students' practice, the procedure for completing the undergraduate research project/thesis, evaluating student achievements, educational and financial agreements with students, and the accumulation of credits by the student, and other information is provided on the page of the Department of Educational Process Management. <https://gtu.ge/Study-Dep/Forms/Forms.php>.

## Program Objective

The objective of the educational program is to prepare a Bachelor in Mechanical Engineering equipped with theoretical knowledge and practical skills competitive in the local and international labor market, who will know:

**Objective 1.** Fundamental principles of mechanical engineering and modern engineering technologies and their application in the rapidly developing environment of modern technologies;

**Objective 2.** Principles and methodological approaches of construction of machinery and machine systems for functional purposes in various fields of production;

**Objective 3.** Designing, manufacturing, diagnostics and technical service of machines and equipment intended for production and service of products, as well as individual products and devices.

## Learning Outcomes/Competences (general and professional)

- Lists the principles and theories of natural and general engineering science related to mechanical engineering based on some of the most recent aspects of widespread theories;
- Describes the problems of design, development, maintenance and repair of the machinery, equipment and separate products in the field of mechanical engineering based on general, technical and field broad knowledge;
- Adheres to technical and operational norms, safety requirements and international standards of production technological machines;
- Determines the results of design and experimental data using industry standard and some state-of-the-art methods;
- Connects important aspects of machinery design, operation, repair and plant design in accordance with predetermined guidelines;
- Participates in the design, adjustment and management of automated, electromechanical, electrohydraulic and electropneumatic drives of machines and machine systems on the instructions of the supervisor;
- Uses modern computer technologies in the performance of mechanical engineering, production facilities and mechanical enterprise planning works in accordance with predetermined guidelines;
- Presents opinions, presentations, conclusions about existing problems in mechanical engineering and their solutions, in appropriate forms for contact with specialists and non-specialists, using information and communication technologies;
- Plans the need for further learning process with a high degree of independence.

## Methods of Achieving Learning Outcomes (Teaching - Learning)

- Lecture Seminar (working in groups) Practical class Laboratory Practice  
Course work/project Consultation Independent work

Based on the specifics of a learning course, the appropriate activities listed below are employed, reflected in the relevant learning courses (syllabi):

discussion/debate; cooperative teaching; group (collaborative) work; problem-based learning (PBL); inductive; deductive; case study; demonstration; verbal; explanatory; action-oriented teaching; analysis; written work; synthesis; role-playing and situational games; project development and presentation.

### Student Knowledge Assessment System

Grading system is based on a 100-point scale.

Positive grades:

- (A) - Excellent - the rating of 91-100 points;
- (B)-Very good - - the rating of 81-90 points
- (C) - Good- the rating of 71-80 points
- (D) - Satisfactory- the rating of 61-70 points
- (E) - Enough- the rating of 51-60 points

Negative grades:

- (FX) - Did not pass - 41-50 points of rating, which means that the student needs more work to pass and is given the right to take the exam once more with independent work;
- (F)-Failed - 40 points and less, which means that the work carried out by the student is not enough and he/she has to learn the subject from the beginning.

In the case of obtaining FX in a component of an educational program, GTU means an additional exam no less than 5 days after the announcement of the results of the final exam. The number of points obtained in the final assessment is not added to the grade obtained by the student in the additional exam. The grade obtained in the additional exam is the final grade and is reflected in the final grade of the component of the educational program. If the final grade of the educational component is from 0 to 50 points, taking into account the grade obtained in the additional exam, the student is assigned an F-0 grade.

In each component, the program part of assessing the level of achievement of student learning outcomes consists of an intermediate assessment and a final exam. The midterm assessment includes ongoing activities and a midterm exam.

Each form and component of assessment determines its share of the final grade from the total assessment score (100 points). In particular, the maximum score of the ongoing activities is 60, and the maximum score of the final exam is 40.

Each assessment form includes an assessment component(s), which includes an assessment method(s), and the assessment method(s) is measured by assessment criteria.

A student who exceeds the minimum competency threshold during the ongoing activities (scoring at least 30 points) is eligible to take the final exam. The dates of the intersemester exam and the dates of the final / additional exam will be indicated in the order of the rector in the semester schedule.

Detailed information about the "Rules for conducting and evaluating student internships at the Georgian Technical University" and "Rules for a bachelor's work" is available on the GTU website:

<https://gtu.ge/Study-Dep/Forms/Forms.php>

### Sphere of Employment

Graduates of mechanical engineering qualification will be employed in mechanical engineering, aviation, automotive, transport, industrial, metallurgy, energy, construction and other enterprises, whose activities are related to the processes of designing, manufacturing, diagnostics, testing and maintenance of machines and mechanical systems.

Potential for Further Education

Master's Educational Programs

Human and Material Resources Required to Implement the Program

The programme is provided with adequate material and human resources. See the attached documents for more information.

Number of Attached Syllabuses: 57

Courses in the Program

No	Learning Course	Course Prerequisites	ECTS Credits									
			Year I		Year II		Year III		Year IV			
			Semester									
			I	II	III	IV	V	VI	VII	VIII		
1.	Engineering Mathematics 1.1	No prerequisites	5									
2.	General Physics A	No prerequisites	4									
3.	General chemistry A	No prerequisites	4									
4.	Descriptive Geometry	No prerequisites	3									
5.	Introduction to Mechanical Engineering	No prerequisites	3									
6.	Fundamentals of information technologies	No prerequisites	4									
7.	Free Components 1		5									
8.	Occupational safety and emergency control	No prerequisites	3									
9.	Engineering Mathematics 2.1	Engineering Mathematics 1.1		5								
10.	General Physics B	General Physics A		5								
11.	Projective and machine drawing	Descriptive Geometry		6								
12.	Elements of Academic Writing	No prerequisites		3								
13.	Theoretical mechanics 1	No prerequisites		5								
14.	Free Components 2			5								
15.	General Materials Science	No prerequisites			5							
16.	Free Components 3				5							
17.	Environment protection and ecology	No prerequisites			3							
18.	Strength of materials	Engineering Mathematics 1.1			5							
19.	Computer Engineering Graphics / AUTODESK AutoCAD Mechanical	Projective and mechanical engineering drawing			4							
20.	Theory of mechanisms and	Theoretical mechanics 1			5							

	machines										
21.	Theoretical mechanics 2	Theoretical mechanics 1			5						
22.	Electrical engineering and electronics	General Physics B;				6					
23.	CAD/CAE technology using Autodesk Inventor	Computer Engineering Graphics / AUTODESK AutoCAD Mechanical				6					
24.	Engineering Thermodynamics and Heat Processes	General Physics B, General chemistry A				5					
25.	Machinery parts 1	Computer Engineering Graphics / AUTODESK AutoCAD Mechanical, Strength of materials, Theory of mechanisms and machines				6					
26.	Free Components 4					5					
27.	Machinery parts 2	Machine Parts 1, CAD/CAE technology using Autodesk Inventor					6				
28.	Systems of Automatic Control	Electrical engineering and electronics					6				
29.	Hydraulics and Pneumatics	General Physics A;					6				
30.	Sensors and Technical Measurements	General Physics B, General Chemistry A, Engineering Thermodynamics and heat processes					6				
31.	Mechanical Vibrations	Theory of mechanisms and machines.					5				
32.	Hydraulics and Electro hydraulics	Hydraulics and Pneumatics, Sensors and Technical Measurements						5			
33.	CNC machine's programming	Machinery parts 2						5			
34.	Electives										
34.1	Aerodynamics	General Physics A						5			
34.2	Aero technologies	General Physics A									
35.	Fundamentals of Programming	Electrical engineering and electronics						5			
36.	Free Components 5								5		
37.	Manufacturing engineering 1	Machinery parts 2, Mechanical Vibrations							6		
38.	Pneumatics and Electro pneumatics	Hydraulics and Pneumatics, Sensors and Technical Measurements								8	
39.	Internship in mechanical engineering	Occupational safety and emergency control, Environment protection and ecology, Hydraulics and Electro									6

		hydraulics, Fundamentals of Programming, Manufacturing engineering 1																		
40.	Manufacturing Engineering 2	Manufacturing engineering 1, Programing of CNC .																	6	
41.	Electives																			
41.1	Planning Mechanical Factories	CAD/CAE technology using Autodesk Inventor																	5	
41.2	Cutting Tools Design	Machinery parts 2																		
41.3	Robotics	Machinery parts 2																		
42.	Flexible Manufacturing Systems	Manufacturing engineering 1																	5	
43.	Computer Integrated Design and Manufacturing	Manufacturing engineering 2																	5	
44.	Management for Engineers	No prerequisites																	5	
45.	Free Components 6																			
46.	Use LabView in Mechanical Engineering	Sensors and Technical Measurements																	7	
47.	Bachelor's work	Compulsory courses of content corresponding to the main field of study, not less than 185 credits.																	8	
			Per semester	31	29	32	28	29	31	30	30									
			Per year	60		60		60		60										
			Total									240								

Free Components (7, 14, 16, 26, 36, 45)

	Title of the Course	Credits
1.	Intranational Menagments	5
2.	Principles of Economics	5
3.	History and Culture of Georgia	5
4.	Sociology	5
5.	Introduction to Philosophy	5
6.	Georgian language 1 (for non-Georgian speakers)	5
7.	Georgian language 2 (for non-Georgian speakers)	5
8.	Georgian language 3 (for non-Georgian speakers)	5
9.	Georgian language 4 (for non-Georgian speakers)	5
10.	Public Relations 2	5
11.	Branding 2	5
12.	Online Communication and Digital Marketing	5
13.	Bases of Policy	5

Program Curriculum

Nº	Course Identification Code	Learning Course	ECTS Credit/Hours	Hours								
				Lecture	Seminar (work in the group)	Practical classes	Laboratory	Practice	Course work/project	Mid-semester exam	Final exam	Independent work
1.	MAS30208E2	Engineering Mathematics 1.1	5	30	-	30	-	-	-	1	2	62
2.	PHS54408E1	General Physics A	4	15	-	-	15	-	-	1	2	67
3.	PHS11504E2	General chemistry A	4	15	-	-	15	-	-	1	2	67
4.	EET78005E2	Descriptive Geometry	3	15	-	15	-	-	-	1	1	43
5.	EET76105E3	Introduction to Mechanical Engineering	3	15	-	15	-	-	-	1	1	43
6.	EET74705E2	Fundamentals of information technologies	4	-	-	30	-	-	-	1	1	68
8.	HHS28303E1	Occupational safety and emergency control	3	15	-	15	-	-	-	1	1	43
9.	MAS30308E2	Engineering Mathematics 2.1	5	30	-	30	-	-	-	1	2	62
10.	PHS54508E1	General Physics B	5	15	-	-	30	-	-	1	2	77
11.	EET76205E3	Projective and machine drawing	6	-	-	60	-	-	-	1	1	88
12.	LEH12512E4	Elements of Academic Writing	3	15	15	-	-	-	-	1	1	43
13.	MAS40401E1	Theoretical mechanics 1	5	15	-	30	-	-	-	1	2	77
15.	EET84804E2	General Materials Science	5	15	-	-	30	-	-	1	1	78
17.	EET29504E1	Environment protection and ecology	3	15	-	-	15	-	-	1	1	43
18.	EET75601E3	Strength of materials	5	30	-	15	-	-	-	1	1	78
19.	EET77705E2	Computer Engineering Graphics / AUTODESK AutoCAD Mechanical	4	-	-	30	-	-	-	1	1	68
20.	EET74805E2	Theory of mechanisms and machines	5	15	-	30	-	-	-	1	1	78
21.	MAS40501E1	Theoretical mechanics 2	5	15	-	30	-	-	-	1	2	77
22.	EET45102E4	Electrical engineering and electronics	6	30	-	15	15	-	-	1	1	88
23.	EET74905E2	CAD/CAE technology using Autodesk Inventor	6	-	-	60	-	-	-	1	1	88
24.	EET47702E4	Engineering Thermodynamics and Heat Processes	5	15	-	20	10	-	-	1	2	77
25.	EET75105E2	Machinery parts 1	6	15	-	15	30	-	-	1	1	88
27.	EET75205E2	Machinery parts 2	6	15	-	-	30	-	15	1	1	88
28.	EET76505E3	Systems of Automatic Control	6	15	-	45	-	-	-	1	1	88



29.	EET75505E2	Hydraulics and Pneumatics	6	30	-	30	-	-	-	1	1	88
30.	EET76105E2	Sensors and Technical Measurements	6	15	-	15	-	30	-	1	1	88
31.	EET75405E2	Mechanical Vibrations	5	15	-	30	-	-	-	1	1	78
32.	EET75705E2	Hydraulics and Electro hydraulics	5	-	-	-	45	-	-	2	3	75
33.	EET76405E2	CNC machine's programming	5	-	-	-	45	-	-	1	1	78
34.1	EET76805E3	Aerodynamics	5	30	-	15	-	-	-	1	1	78
34.2	EET76905E3	Aero technologies	5	30	-	15	-	-	-	1	1	78
35	EET77305E3	Fundamentals of Programming	5	15	-	-	30	-	-	1	1	78
37	EET75905E2	Manufacturing engineering 1	6	30	-	30	-	-	-	1	1	88
38	EET75605E2	Pneumatics and Electro pneumatics	8	-	-	-	90	-	-	2	3	105
39	EET76705E2	Internship in mechanical engineering	6	-	-	-	-	60	-	1	1	88
40	EET76005E2	Manufacturing Engineering 2	6	30	-	30	-	-	-	1	1	88
41.1	EET77005E3	Planning Mechanical Factories	5	15	-	30	-	-	-	1	2	77
41.2	EET76705E3	Cutting Tools Design	5	30	-	15	-	-	-	1	1	78
41.3	EET76605E3	Robotics	5	15	-	20	-	-	-	1	1	88
42	EET76505E2	Flexible Manufacturing Systems	5	30	-	15	-	-	-	1	1	78
43	EET77405E3	Computer Integrated Design and Manufacturing	5	30	-	15	-	-	-	1	1	78
44	EET77105E3	Management for Engineers	5	15	30	-	-	-	-	1	1	78
46	EET76305E2	Use LabView in Mechanical Engineering	7	-	-	-	75	-	-	2	2	98
47	EET76605E2	Bachelor's work	8	-	-	-	-	-	90	2	1	107
1	BUA35005E3	Intranational Menagements	5	15	30	-	-	-	-	1	1	78
2	SOS10912E2	Principles of Economics	5	15	30	-	-	-	-	2	2	76
3	HEL28812E1	History and Culture of Georgia	5	15	30	-	-	-	-	1	1	78
4	HEL28912E1	Sociology	5	15	30	-	-	-	-	1	1	78
5	HEL28712E1	Introduction to Philosophy	5	15	30	-	-	-	-	2	2	76
6	LEH12812E4	Georgian language 1 (for non-Georgian speakers)	5	-	-	45	-	-	-	1	1	78
7	LEH12912E4	Georgian language 2 (for non-Georgian speakers)	5	15	30	-	-	-	-	2	2	76
8	LEH13012E4	Georgian language 3 (for non-Georgian speakers)	5	15	30	-	-	-	-	2	2	76
9	LEH13112E4	Georgian language 4 (for non-Georgian speakers)	5	-	-	45	-	-	-	2	2	76
10	BUA56312E1	Public Relations 2	5	15	30	-	-	-	-	2	2	76
11	BUA56212E1	Branding 2	5	15	30	-	-	-	-	2	2	76

12	BUA56512E1	Online Communication and Digital Marketing	5	15	30	-	-	-	-	2	2	76
13	SOS24911E2	Bases of Policy	5	15	30	-	-	-	-	2	2	76

Program Supervisors/Supervisors



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Agreed with  
Quality Assurance Service of GTU



David Makhviladze

**Approved by**  
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Chairman of the Faculty Council



Otar Gelashvili